

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Canceled)

2. (Currently Amended) ~~The catalyst of claim 1, which is a supported catalyst in which KMgPO₄ is supported on a carrier~~ A catalyst for hydrocarbon steam cracking, which comprises a supported KMgPO₄ catalyst, wherein the KMgPO₄ supported catalyst is obtained by supporting KMgPO₄ on a carrier.

3. (Original) The catalyst of claim 2, wherein the carrier is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

4. (Original) The catalyst of claim 2, wherein a content of KMgPO₄ in the supported catalyst is in a range of 0.5-30 wt %, based on the total weight of the supported catalyst.

5. (Original) The catalyst of claim 2, wherein KMgPO₄ is derived from a KMgPO₄ precursor prepared from magnesium nitrate hydrate, potassium hydroxide, and ammonium phosphate.

6. (Original) A method for preparing a catalyst for hydrocarbon steam cracking, which comprises: dissolving a KMgPO₄ precursor in water to prepare an aqueous solution of the KMgPO₄ precursor; and impregnating a carrier with the aqueous solution of the KMgPO₄ precursor to prepare a supported catalyst.

7. (Original) The method of claim 6, further comprising sintering the supported catalyst.

8. (Original) The method of claim 7, wherein the sintering is carried out at 1,000-1,400°C for 22-26 hours.

9. (Original) The method of claim 6, wherein the KMgPO₄ precursor is prepared from magnesium nitrate hydrate, potassium hydroxide, and ammonium phosphate.

10. (Original) The method of claim 6, wherein the carrier is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminato, and zeolite.

11. (Currently Amended) ~~The catalyst of claim 1, which is a sintered catalyst obtained by sintering a KMgPO₄ powder or a KMgPO₄ precursor powder and metal oxide A catalyst for hydrocarbon steam cracking, which comprises a sintered KMgPO₄ catalyst, wherein the KMgPO₄ sintered catalyst is obtained by sintering a KMgPO₄ powder or a KMgPO₄ precursor powder and a metal oxide.~~

12. (Original) The catalyst of claim 11, wherein a content of KMgPO₄ in the sintered catalyst is in a range of 0.5-50 wt %, based on the total weight of the sintered catalyst.

13. (Original) The catalyst of claim 11, wherein the metal oxide is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminato, and zeolite.

14. (Original) The catalyst of claim 11, wherein the KMgPO₄ precursor is prepared from magnesium nitrate hydrate, potassium hydroxide, and ammonium phosphate.

15. (Original) A method for preparing a catalyst for hydrocarbon steam cracking, which comprises:

mixing a KMgPO₄ powder or a KMgPO₄ precursor powder and metal oxide; and

sintering the resultant mixture to obtain a sintered catalyst of KMgPO₄-metal oxide.

16. (Original) The method of claim 15, wherein the sintering is carried out at 1,000-1,400°C for 22-26 hours.

17. (Original) The method of claim 15, wherein the metal oxide is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

18. (Currently Amended) A method for producing olefins by steam cracking of hydrocarbons in the presence of ~~the catalyst selected from the group consisting of a catalyst comprising KMgSO₄ as a catalytic component, a supported catalyst and a sintered catalyst the supported KMgPO₄ defined in claim 2 or the sintered KMgPO₄ defined in claim 11.~~

19. (Original) The method of claim 18, wherein the steam cracking is carried out at a reaction temperature of 600-1,000°C, a weight ratio of steam/hydrocarbons of 0.3-1.0, and LHSV (Liquid Hourly Space Velocity) of 1-20 hr⁻¹.

20. (Original) The method of claim 18, wherein the steam cracking is carried out in a reactor selected from the group consisting of a fixed-bed reactor, a fluidized-bed reactor, and a mobile phase reactor.

21. (Original) The method of claim 18, wherein the catalyst is regenerated by removal of cokes formed on a surface of the catalyst at 500-1,300°C in the presence of air, steam, or a mixture thereof after the steam cracking.